Disorders of Language - Aphasias

Dr. Sarosh M. Katrak

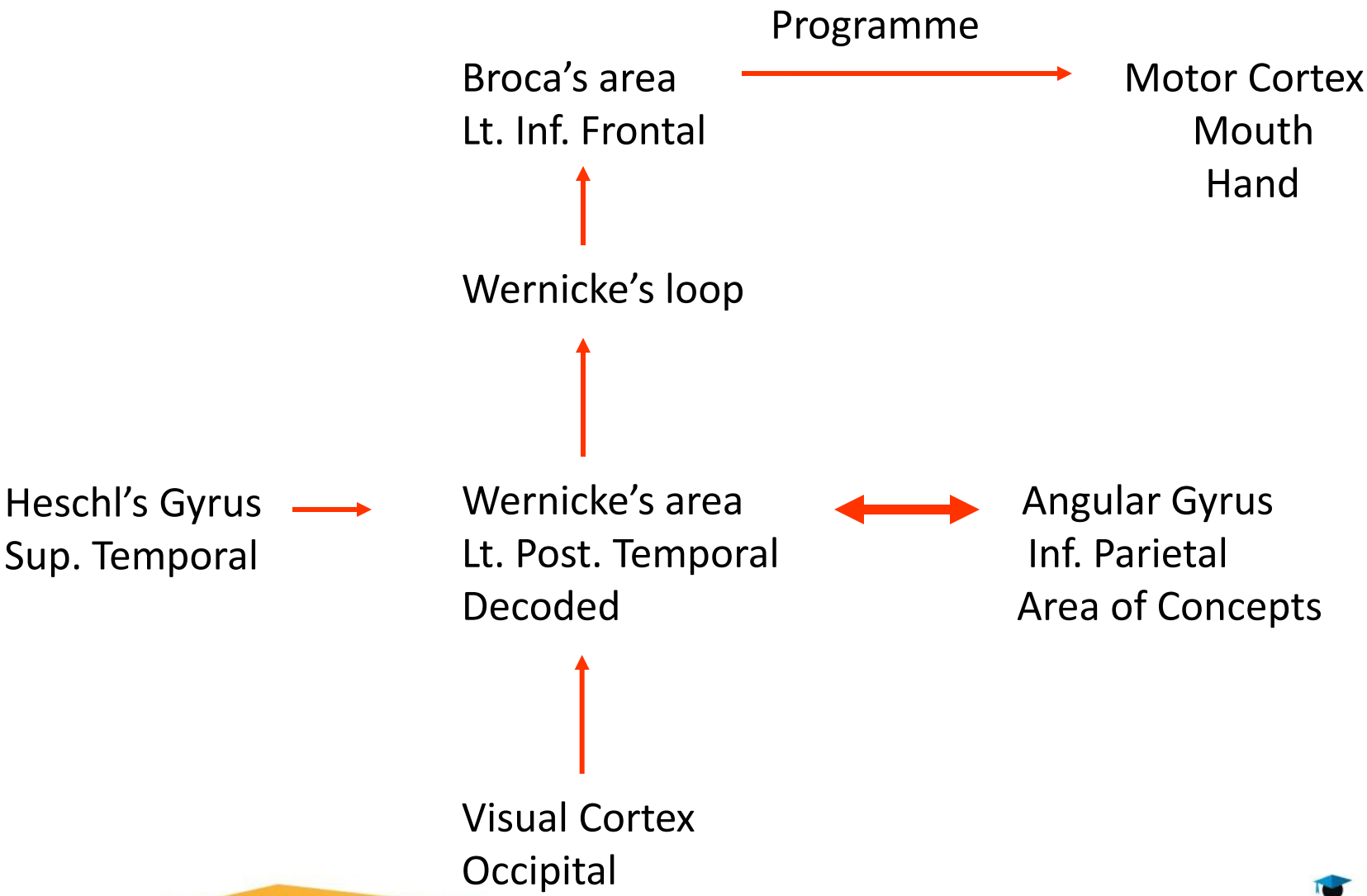
Director, Dept. of Neurology, JHRC &
Prof. Emeritus, GMC & Sir J.J. Group of Hospital

MISSING LINK

INTRODUCTION

- Language
  - The ability to communicate through common symbols
  - The most human of attributes
- Aphasia
  - The study of language disorders should be distinguished from Developmental dyslexia & Disorders of phonation

Main Language Circuit



Development of Concepts

- Normal Development of language begins with development of concepts
- Initially sound, touch, colour, babbling, words, sentences reading / writing
- During this evolution, you also develop concepts

Hearing and Answering

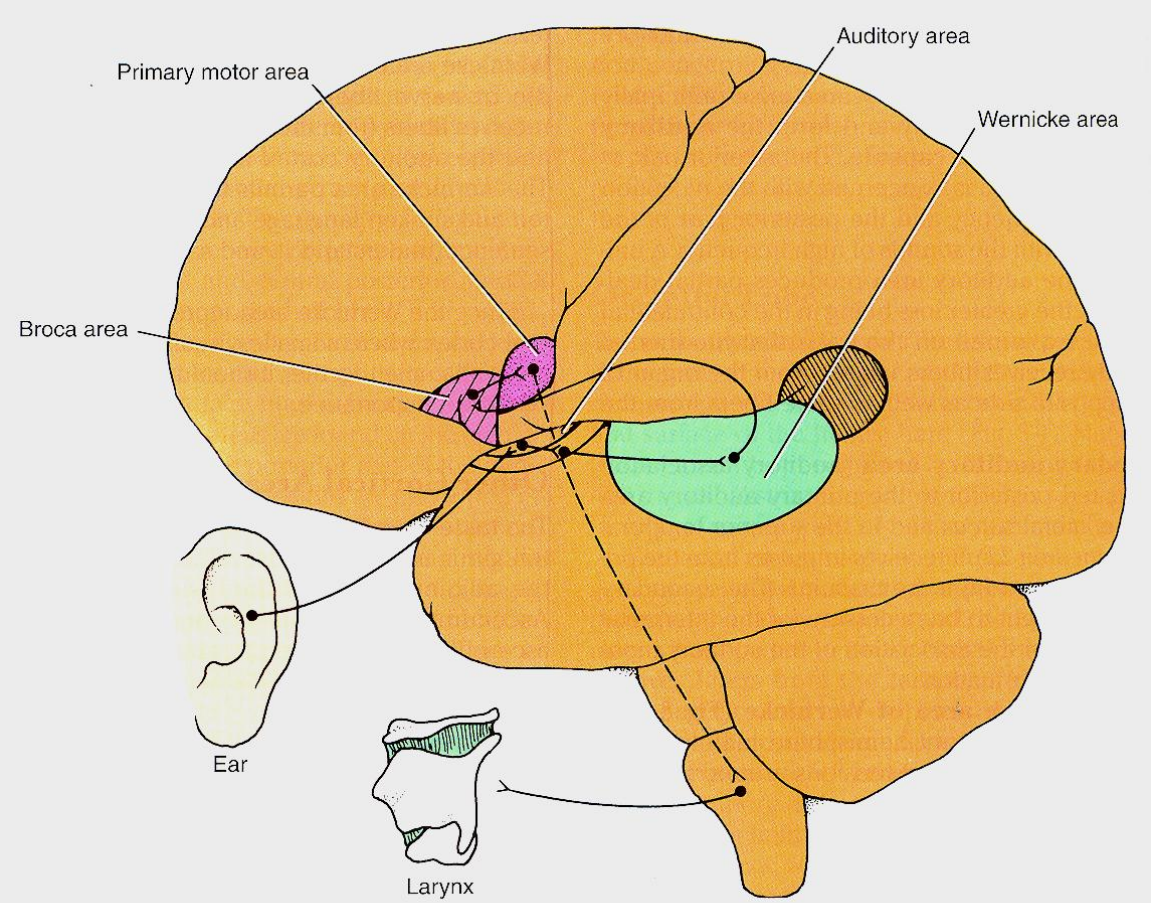
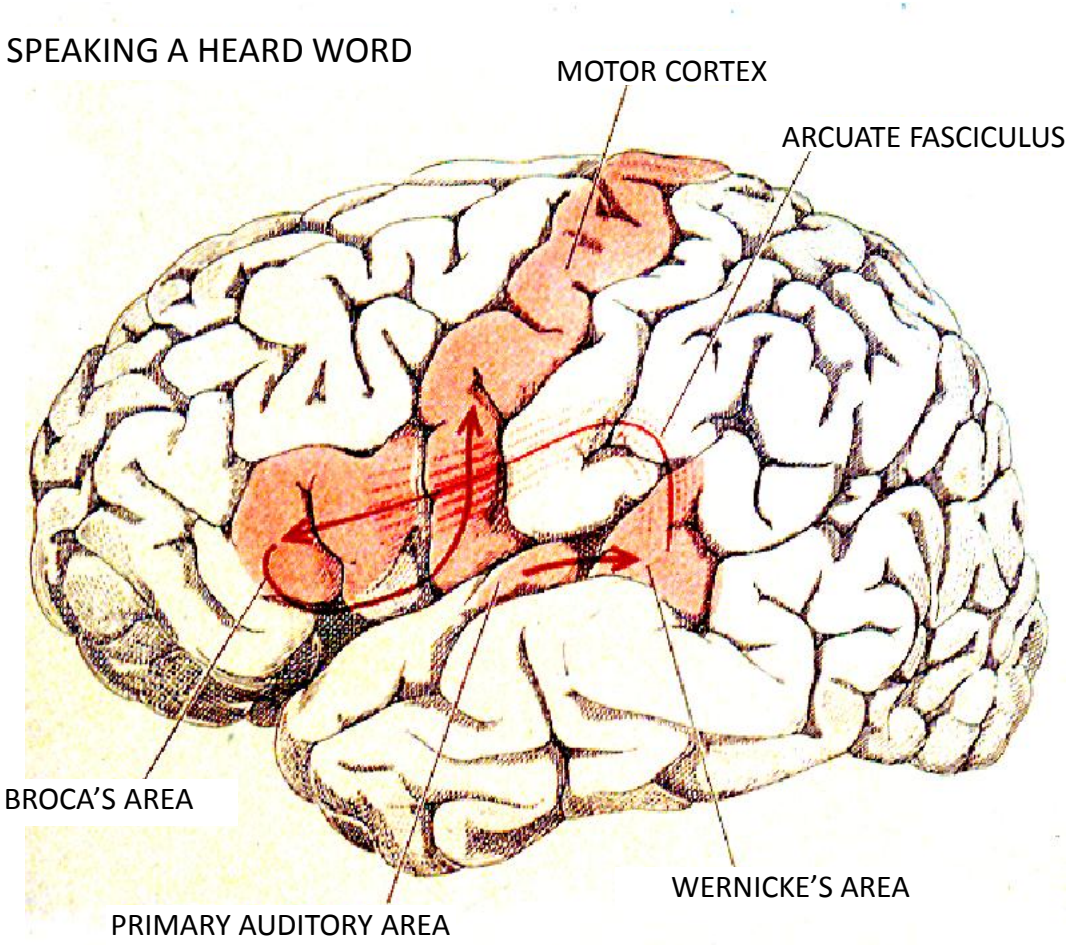


Figure 8-7 Probable nerve pathways involved with hearing a question and answering it.

Hearing and Answering



Reading and Repeating a Word

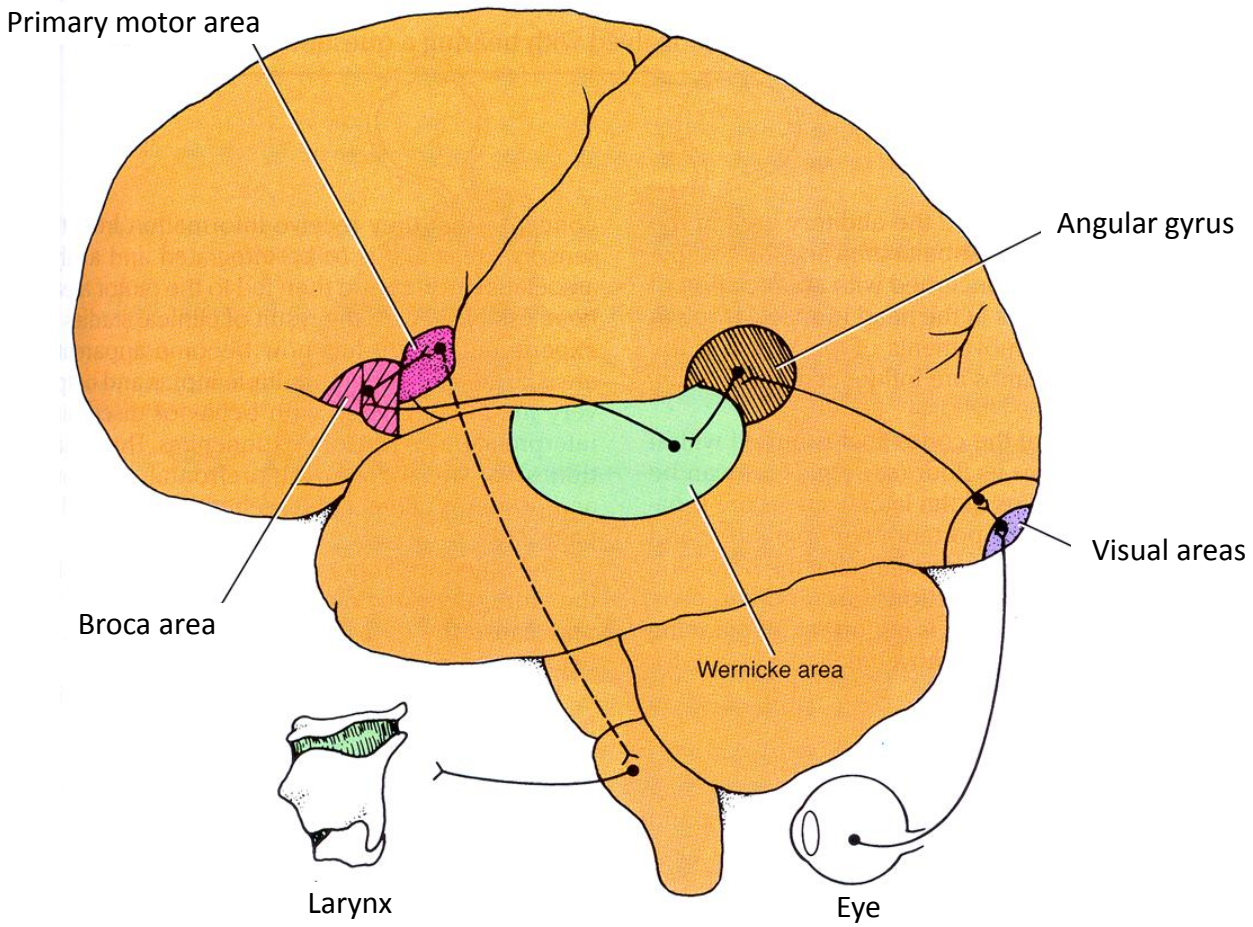
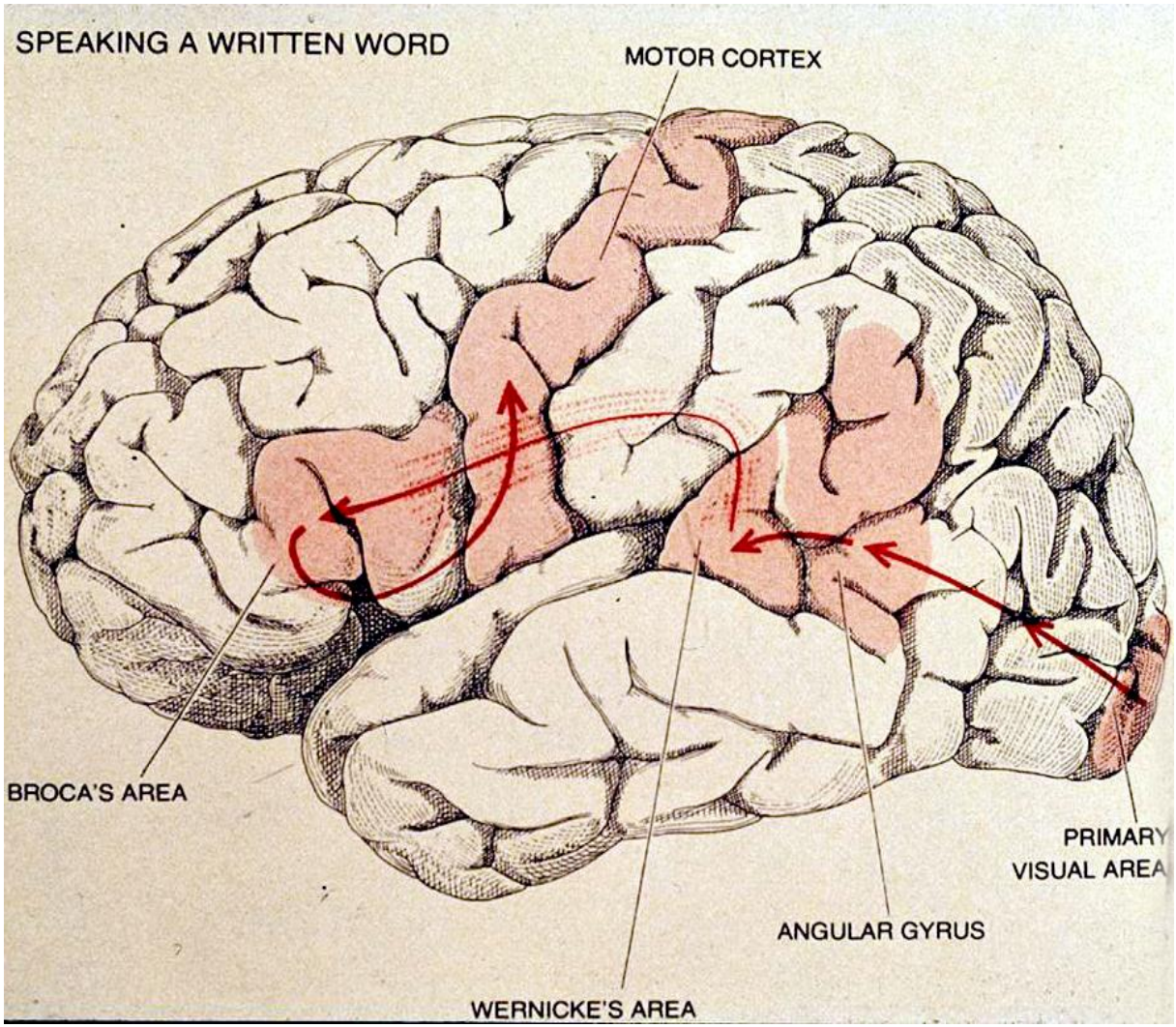
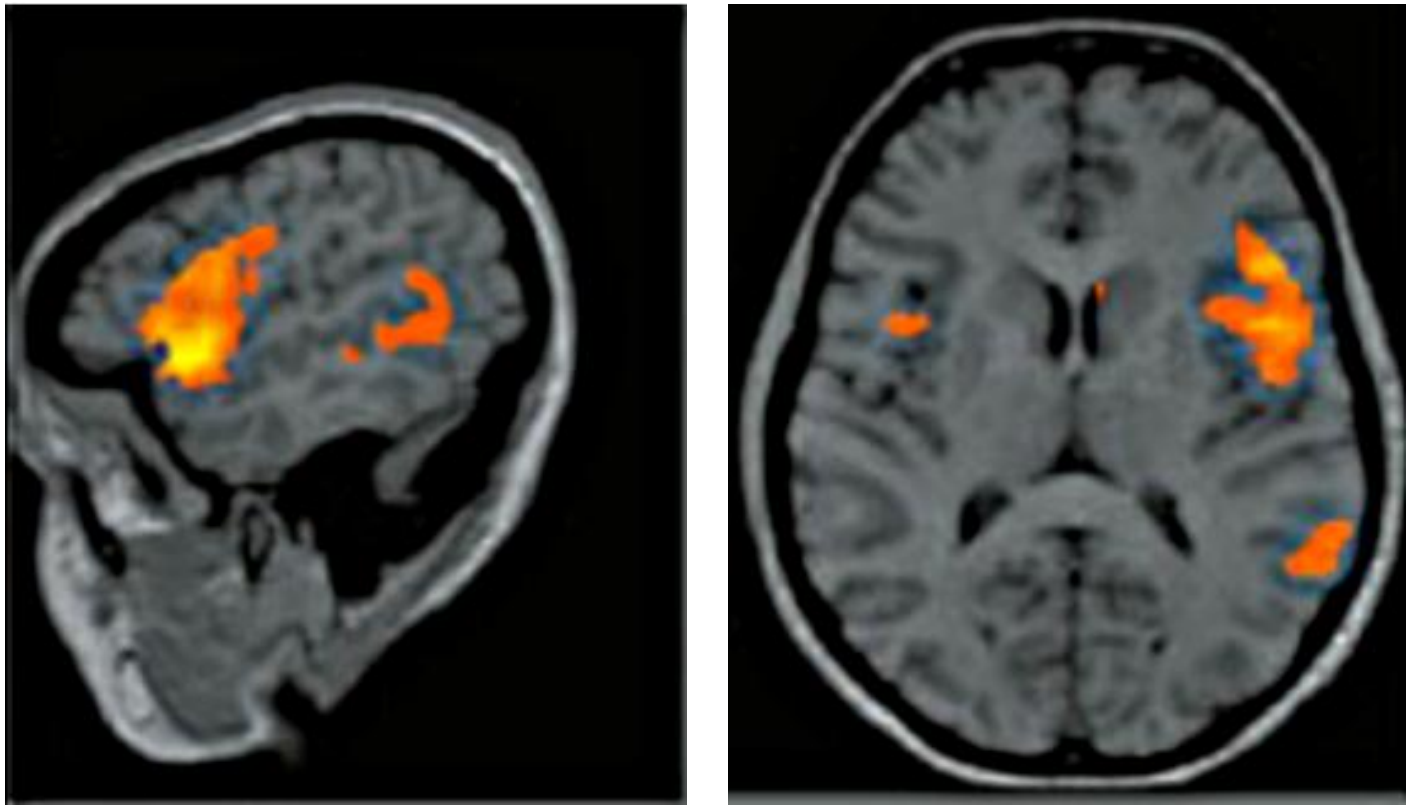


Figure 8-6 Probable nerve pathways involved in reading a sentence and repeating it out loud.

Reading and Repeating a Word



Aphasia Circuit Imaging: fMRI BOLD



BEDSIDE EVALUATION OF APHASIA

- Spontaneous speech
- Comprehension of spoken speech
- Repetition
- Naming
- Reading - Aloud for comprehension
- Writing - Copying to dictation spontaneous sentences

SPONTANEOUS SPEECH

- Assess during history taking or asking patient to describe nature of work
- Fluent: Posterior to Sylvian fissure
  Rhythmic prosody – Paraphasia ++
- Non-fluent: Anterior to Sylvian fissure
  Non-rhythmic prosody
  Telegraphic / SMS speech
  Dysarthria, lot of effort

TERMINOLOGY

- Prosody: Rhythm of spoken speech
  Melodic or non-melodic
- Semantic Paraphasia: Incorrect use of a word or substitution within language
- Literal: Grass is blue (green)
  Phonemic Bone (phone)
  Neologistic Spoot (spoon) peapar (people)
  Jargon Plenty of paraphasia

COMPREHENSION

- Perform simple / complex activity to spoken order
- Answer Yes or No
- Point to named object
- Describe object and ask to point to it
- Rarely all or none phenomenon
- Bilateral body parts easier to perform

REPETITION

- Digits
- Common words e.g house, pen
- Complex sentences
- Multisyllabic words: No ifs, ands or buts
- Tendency to repeat everything: Echolalia
- Predominant repetition defect seen in conduction aphasia

NAMING

- Assess by confrontation – objects, body parts, colour
- Tactile – object in hand
- Auditory – bunch of keys, bell, whistle
- Can occur in aphasic as well as non-aphasic disorders - acute confusional state, dementias

READING

- Assess: Written names of objects – read aloud and point read complex sentences
- Test ability to read aloud read with comprehension
- Disorders of reading: Alexia developmental dyslexia

WRITING

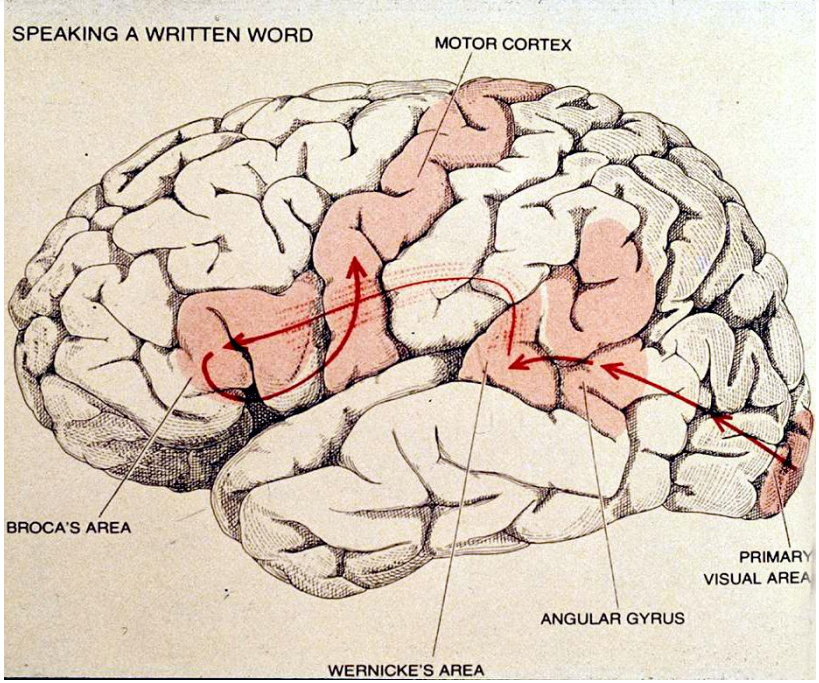
- Assess:
  - Signature – over learnt trait
  - Copy a written sentence
  - Write a sentence about your work
- Fluent aphasias:
  - Handwriting proper but misspelt words
- Non-fluent aphasias:
  - Messy but correct spellings

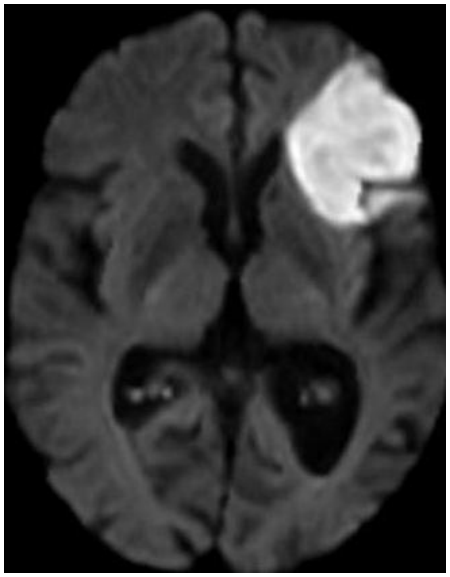
CLASSIFICATION OF APHASIAS

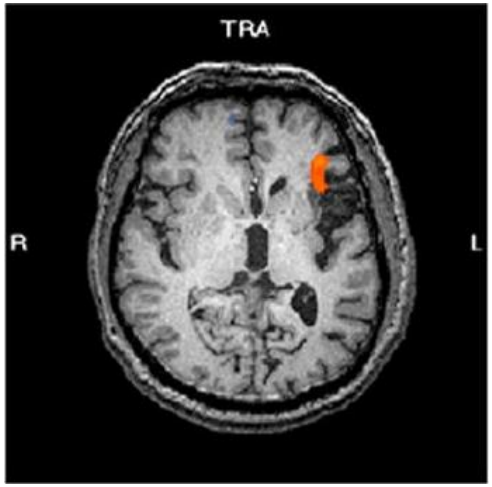
- Symptom Complex: Rarely classical
- Resembles one symptom complex more than another
- Establish main / predominant defect
- Danger of early evaluation in strokes
- In strokes character of aphasia may change
- Optimal time of evaluation between 2-4 weeks

BROCA'S APHASIA

- Spontaneous speech: Non-fluent
- Comprehension: Relatively Intact
- Repetition: Abnormal
- Naming: Abnormal
- Reading: Aloud abnormal
  Comprehension normal or abnormal
- Writing: Abnormal but correct spellings
- CNS examination: Rt. Hemiplegia or faciobrachial
  Lt. MCA infarct
  Trauma, tumours, infection


SPEAKING A WRITTEN WORD
MOTOR CORTEX
BROCA'S AREA
PRIMARY VISUAL AREA
ANGULAR GYRUS
WERNICKE'S AREA

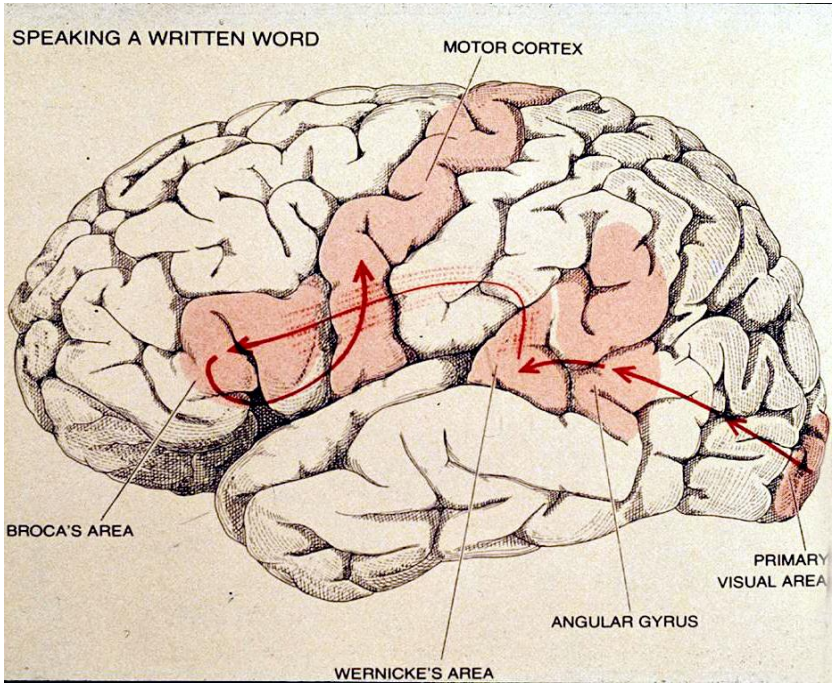


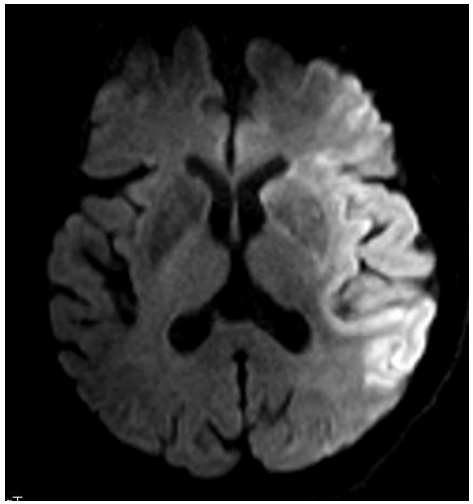

TRA
R
L

WERNICKE'S APHASIA

- Spontaneous speech: Fluent, paraphasic
- Comprehension: Abnormal
- Repetition: Abnormal
- Naming: Abnormal
- Reading: Aloud abnormal
  Comprehension abnormal
- Writing: Copying abnormal
  Comprehension abnormal
- CNS examination: No hemiplegia, Superior temporal quadrantanopia

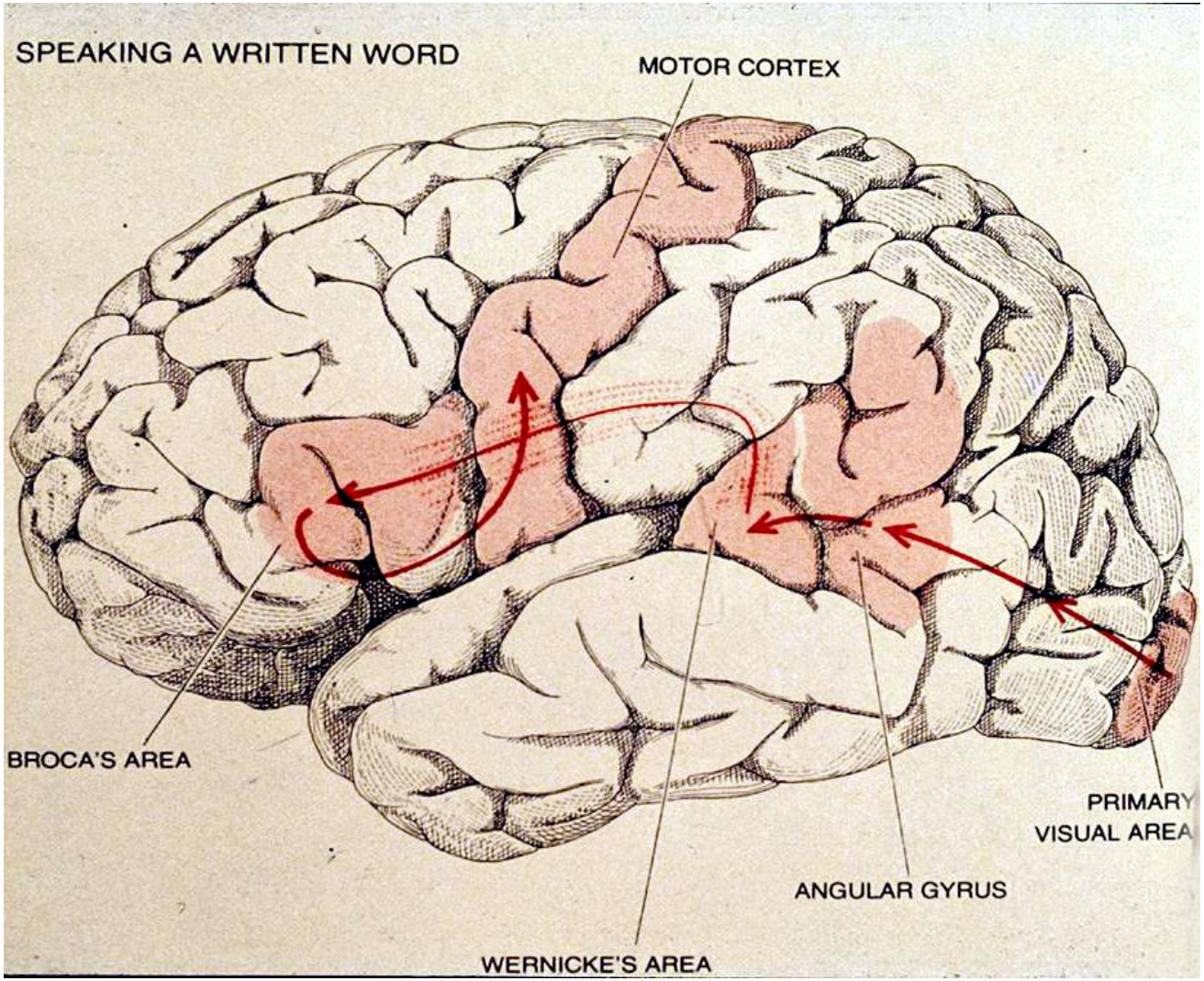
  Note: Danger of psychosis or dementia


SPEAKING A WRITTEN WORD
MOTOR CORTEX
BROCA'S AREA
PRIMARY
VISUAL AREA
ANGULAR GYRUS
WERNICKE'S AREA



CONDUCTION APHASIAS

- Spontaneous speech: Fluent
- Comprehension: Normal
- Repetition: Grossly abnormal
- Naming: Abnormal
- Reading: Aloud abnormal
  Comprehension abnormal / normal
- Writing: Abnormal
- CNS examination:
  - Lesion in the Wernicke's Loop, Subcortical
  - Variable Findings
  - Usually seen in recovery phase


SPEAKING A WRITTEN WORD
MOTOR CORTEX
BROCA'S AREA
WERNICKE'S AREA
ANGULAR GYRUS
PRIMARY
VISUAL AREA

GLOBAL APHASIA

- Large lesion involving the dominant hemisphere
- Complete MCA block
- Characteristics are a combination of Broca's and
- Wernicke's aphasia
- During recovery patient may show features of
- BA or WA

TRANSCORTICAL APHASIAS

- Lesion in the deep white matter of dominant Hemisphere
- Main language circuit is intact – Broca's area,
- Arcuate fascicle and Wernicke's area
- Lesion in white matter separates other cortical areas from language circuits
- Characteristics TMA: BA with repetition intact
- Lesion: Anterior to Broca's – dominant ACA
- TSA: Rare. Lesion subcortical white matter of Temporo-occipital area

ANOMIC APHASIA

- Principal defect: Naming
- Lacks localising value of other aphasic syndromes
- Lesion: Usually angular gyrus but may be in the frontal, parietal or temporal areas
- Can occur in acute confusional states, dementia and metabolic disorders
- Usually seen in ICUs during recovery from coma

Analysis of Aphasias

	Sp Sp	Comp	Rpt	Nam	Reading		Writing
					Aloud	Comp	
Broca's	NF	+	--	+/-	--	+	--
Wernicke's	F	--	--	--	--	--	+
Conduction	F	+	--	--	--	+	+
Transcortical Motor Aphasia	NF	+	+	+	+	+	+/-
Transcortical Sensory Aphasia	F	--	--	+ echolalia	--	--	--
Anomic (Nominal)	F	+	+	--	--	--	+

+ Not affected, - Affected F = Fluent, NF = Non-fluent

MISSING LINK

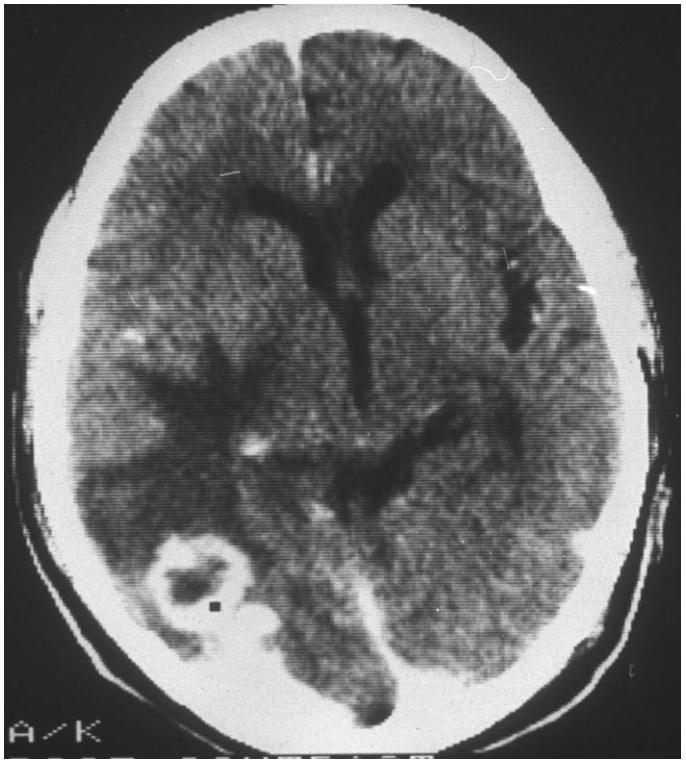
ALEXIA WITH AGRAPHIA

- Characteristics:
- Lesion:
  - Left Inferior Parietal Lobule
  - Angular Gyrus
- Speech: Fluent, Intact Comprehension
- Reading: Impaired
- Writing: Impaired
- Assoc. Signs: Gerstmann Syndrome, Right Visual Field Defect

Alexia with Agraphia

GS Male 54yrs,

CT scan: Lt. Parieto-occipital tuberculoma



Alexia without Agraphia

- Lesion: Lt. Occip. Lobe, Splenium & Medial temporal lobe
- Speech: Normal
- Comprehension: Intact
- Reading: Impaired
- Writing: Intact
- Associated Lesions:
  - Rt. Homonymous hemianopia
  - Recent memory loss
  - ± motor sensory signs

The patient cannot Read what he has written

Alexia without Agraphia

- Fr. J. S. - Jesuit Priest who said “I have to lock myself in my room when I write letters to Rome; if I am disturbed I can’t read what I have written.”
- Right Homonymous Hemianopia: Naming Defect
- Could Arrange Playing Cards in Ascending Order, but could not identify them.
- Slowly progressed to Alexia with Agraphia
- Lesion - Cystic Glioma in the Left Parieto-Occipital Region

Alexia without Agraphia

Lt. Carotid angiogram showing posterior temporo-parieto-occipital glioma